

Section 13

ORAL AND PHARYNGEAL CANCER

It is estimated that in the United States approximately 30,000 people are being diagnosed with and 8,000 deaths are occurring annually from oral and pharyngeal cancer (Silverman, 2001). Oral cancers currently represent about 3% of all cancer deaths. The 5-year survival rate for oral and pharyngeal cancers of 52% is one of the lowest rates among all cancers and has not changed in three decades (Ries et al., 2001). Oral cancer is one of the most debilitating of all cancers, with extremely high morbidity resulting from the disease and its treatment. Treatment modalities generally involve surgery, radiation, or a combination of the two. Oral cancer therapy is frequently associated with disfigurement, diminished speech fluency, and inability to eat and swallow, often resulting in a substantial decrease in quality of life (Shiboski et al., 2000).

Greater than 90% of oral cancer cases occur after age 45 years, with the average age at diagnosis about 60 years (Silverman, 1998). In addition, recent increases in incidence have been observed among individuals less than 40 years of age, particularly for cancer of the tongue. These increases do not seem to be associated with known risk factors such as tobacco or with immune suppression (Shiboski et al., 2000; Silverman, 2001). Oral cancer occurs more commonly in men than in women and is more frequent among black men than among white men. Surveillance, Epidemiology, and End Results (SEER) statistics from 1994 to 1998 showed the incidence in males to be 2.6 times that in females (14.8 per 100,000 compared to 5.8 per 100,000). The rate was highest for black males (20.5 per 100,000). Among females the rates for whites and blacks were comparable (6.1 per 100,000 compared to 5.8 per 100,000) (Silverman, 2001).

The vast majority of oral cancers (approximately 75%) are associated with tobacco and alcohol use. Combined use of both agents significantly increases the risk of developing oral and pharyngeal cancer. Neither SEER data nor that of most State Cancer Registries currently track risk factors, such as tobacco and alcohol use, in recently diagnosed patients, making examination and monitoring of these factors more difficult.

The majority of oral cancers are squamous cell carcinomas. Cancer of the tongue is the most frequent site, comprising more than one-fourth of oral cancers reported to the SEER program from 1973 through 1996 (Shiboski et al., 2000).

Oral cancer survival is highly correlated with stage at diagnosis. Most oral cancers are currently diagnosed in advanced stages, decreasing probability of survival and increasing treatment morbidity. Oral cancer can frequently be detected with a comprehensive oral exam performed by a trained clinician, including intra-oral examination and external palpation. However, the frequency of screening exams for oral cancer is low, even among those over 50 years of age and among high-risk groups. This has been attributed in part to a need for greater awareness and training among dental professionals and a lack of knowledge on the part of the general population (Horowitz et al., 2001; Yellowitz et al., 2000).

This section examines stage at diagnosis, screening, deaths, and sites of oral and pharyngeal cancer.

REFERENCES

- Horowitz AM, Siriphand P, Sheikh A, Child W. Perspectives of Maryland dentists on oral cancer. *J Am Dent Assoc* 2001;132:65-72.
- Ries LA, Eisner MP, Kosary CL, et al (eds). *SEER Cancer Statistics Review, 1973-1998*. Bethesda, MD: National Cancer Institute, 2001.
- Shiboski CH, Shiboski SC, Silverman S Jr. Trends in oral cancer rates in the United States, 1973-1996. *Community Dent Oral Epidemiol* 2000;28:249-56.
- Silverman S Jr. *Oral Cancer*, 4th edition. American Cancer Society. Hamilton, Ontario, Canada: Decker Inc., 1998.
- Silverman S Jr. Demographics and occurrence of oral and pharyngeal cancers. The outcomes, the trends, the challenge. *J Am Dent Assoc* 2001 Nov;132 Suppl:7S-11S.
- Yellowitz JA, Horowitz AM, Drury T, Goodman HS. Survey of U.S. dentists' knowledge and opinions about oral pharyngeal cancer. *J Am Dent Assoc* 2000;131:653-61.

13.1 Stage at diagnosis of oral and pharyngeal cancer

Stage at diagnosis of oral and pharyngeal cancers has a profound influence on survival from the disease. Unfortunately, many oral cancers were diagnosed at advanced (regional or distant 47.7%) versus localized (in situ or local 39.6%) stage, thereby playing a role in the poor survival. The problem of advanced stage at diagnosis was even more dramatic among blacks, with 22.3% being localized and 63.8% advanced at diagnosis, compared to whites, with 41.8% localized and 45.7% advanced at diagnosis. Improvements in earlier detection should allow for improvements in survival, especially among blacks (based on Surveillance, Epidemiology, and End Results [SEER] data for the years 1991 through 1995).

SOURCE OF DATA

The analyses reported here are based on Surveillance, Epidemiology, and End Results (SEER) Cancer Incidence Public-Use Database, 1973-1997, August 1999 Submission.

■ Age-adjusted incidence rates were highest for oral and pharyngeal cancers with regional spread, followed by localized cancers. Age-adjusted rates were lowest for in situ lesions (Figure 13.1.1).

■ Differences by race/ethnicity (Figure 13.1.2)

- Whites had higher incidence rates of diagnosis than blacks at in situ and localized stages, while blacks had higher rates of diagnosis at regional and distant stages as well as a higher overall incidence rate.

■ Differences by gender (Figure 13.1.3)

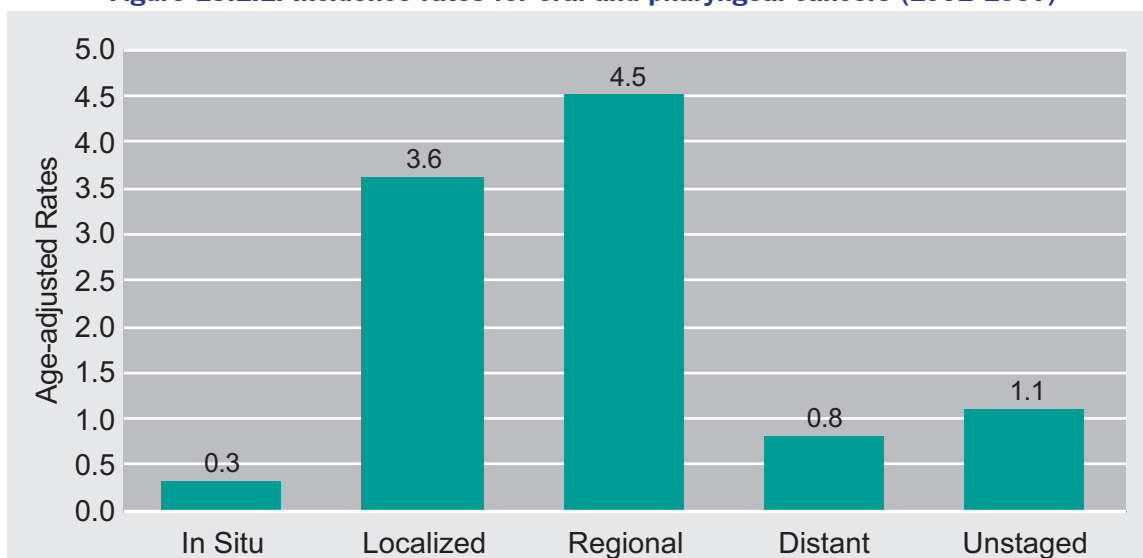
- Males were more likely (twofold to threefold) than females to be diagnosed with oral and pharyngeal cancers. This is true for every stage at diagnosis and within each racial/ethnic group at each stage at diagnosis.

■ Differences by age (Figure 13.1.4)

- Oral and pharyngeal cancers were relatively infrequent below age 40. Five-year age groups showed increases until ages 65-69 after which rates leveled off.

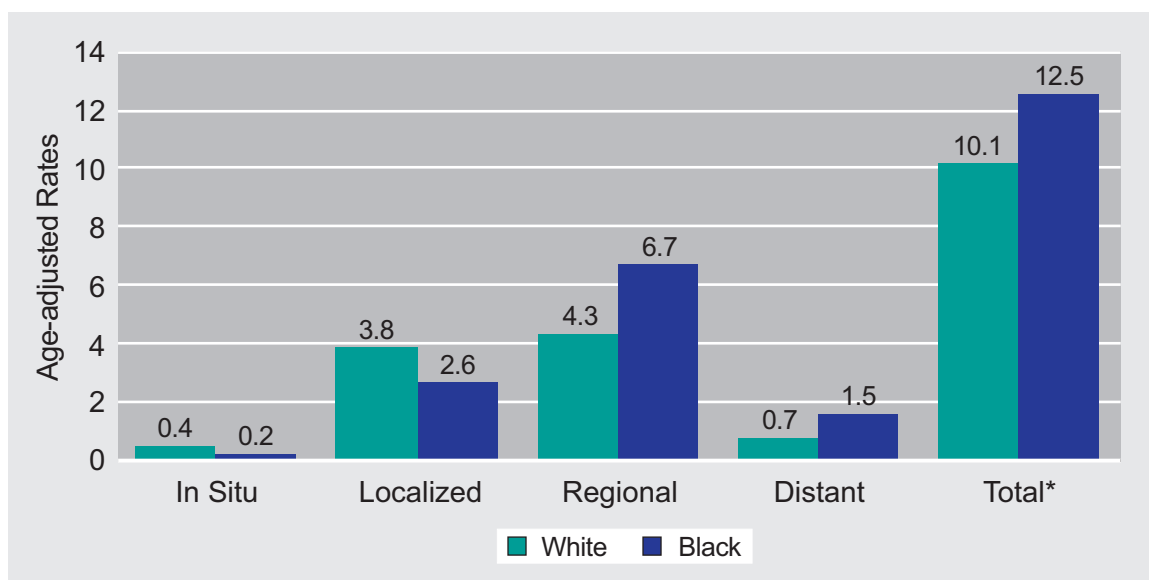
Bullets reference data that can be found in Tables 13.1.1, 13.1.2, and 13.1.3.

Figure 13.1.1. Incidence rates for oral and pharyngeal cancers (1992-1997)



Data source: Surveillance, Epidemiology, and End Results (SEER) 11 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

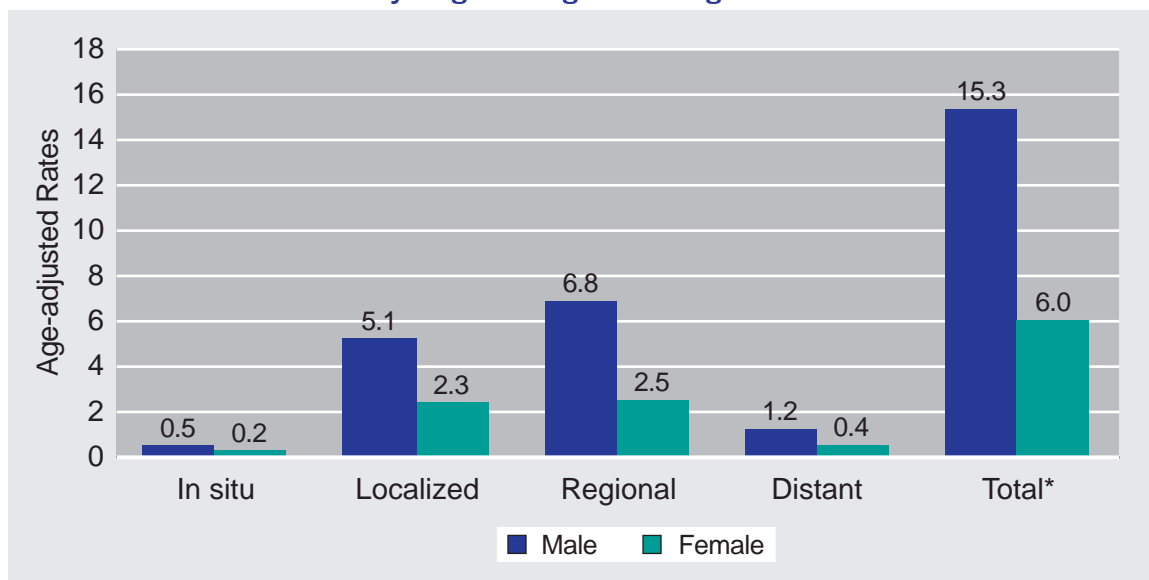
**Figure 13.1.2. Incidence rates for oral and pharyngeal cancers (1992-1997)
by stage at diagnosis and race/ethnicity**



* The totals in this figure include the unstaged cancers.

Data source: Surveillance, Epidemiology, and End Results (SEER) 11 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

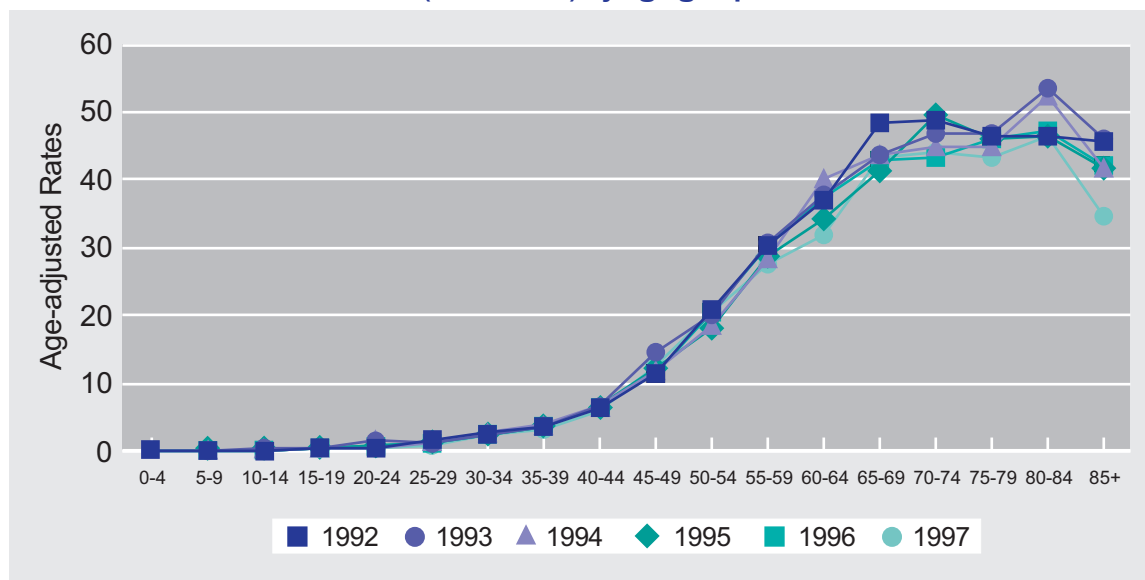
**Figure 13.1.3. Incidence rates for oral and pharyngeal cancers (1992-1997)
by stage at diagnosis and gender**



* The totals in this figure include the unstaged cancers.

Data source: Surveillance, Epidemiology, and End Results (SEER) 9 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

Figure 13.1.4. Incidence rates for oral and pharyngeal cancers (1992-1997) by age group



Data source: Surveillance, Epidemiology, and End Results (SEER) 11 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

13.2 Oral and pharyngeal cancer screening

The American Cancer Society recommends an oral cancer examination annually for everyone 40 years of age and older (Smith et al., 2002), while both the Canadian Task Force on the Periodic Health Examination in 1994 and the U.S. Preventive Services Task Force in 1996 found no evidence for or against periodic screening for oral cancer (Hawkins et al., 1999).

Data from the 1992 Cancer Control Supplement to the National Health Interview Survey indicated that only 15% of those aged 40 years and older report ever having had an oral cancer examination, and only 48% of these had one in the past year (Horowitz & Nourjah, 1996; Martin et al., 1996).

More than 75% of oral cancers can be identified either visually or through palpation in a comprehensive oral exam (CDC, 1992). Such an exam is accomplished by a thorough examination of the head and neck, including palpation of lymph nodes and an intra-oral examination including the tongue, oral and pharyngeal mucosal tissues, lips, and intra-oral palpation of the lymph nodes. The mouth is easily accessible to noninvasive examination (Mashberg & Samit, 1995). Although diagnosis at later stages is associated with decreased survival and increased treatment morbidity and progression to these stages is thought to take several years, thorough studies examining the relationship between oral cancer screening, stage at diagnosis, and treatment outcome have not been conducted.

Low oral cancer screening rates may be the result of a lack of public awareness concerning oral cancer signs, symptoms, and risk factors (Horowitz et al., 1990; Horowitz & Nourjah, 1996; Horowitz et al., 1998). In addition, many dentists do not routinely perform oral cancer exams, particularly on the edentulous (Horowitz et al., 2000). Because more adults seek care from physicians than from dentists, it has been suggested that medical personnel be educated on the importance of routinely doing oral cancer detection examination of patients at high risk and be trained in the proper procedures for these examinations (Goodman et al., 1995).

SOURCE OF DATA

The analyses reported here are based on the National Health Interview Survey (NHIS), 1992 and 1998, National Center for Health Statistics, Centers for Disease Control and Prevention.

■ Differences by race/ethnicity (Figure 13.2.1)

- The percentage of non-Hispanic whites reporting an oral cancer exam in the past year was greater than the percentage of non-Hispanic blacks or Hispanics.

cancer exam in the past year than those at or above the federal poverty level.

- Those with 12 years of education or less were less likely to report an oral cancer exam in the past year than those with more than 12 years of education.

■ Differences by gender

- The percentages of males and females reporting oral cancer exams in the past year are similar.

■ Differences by federal poverty level and education (Figure 13.2.1)

- Those living below the federal poverty level were less likely to report an oral

■ Trend by race/ethnicity (Figure 13.2.2)

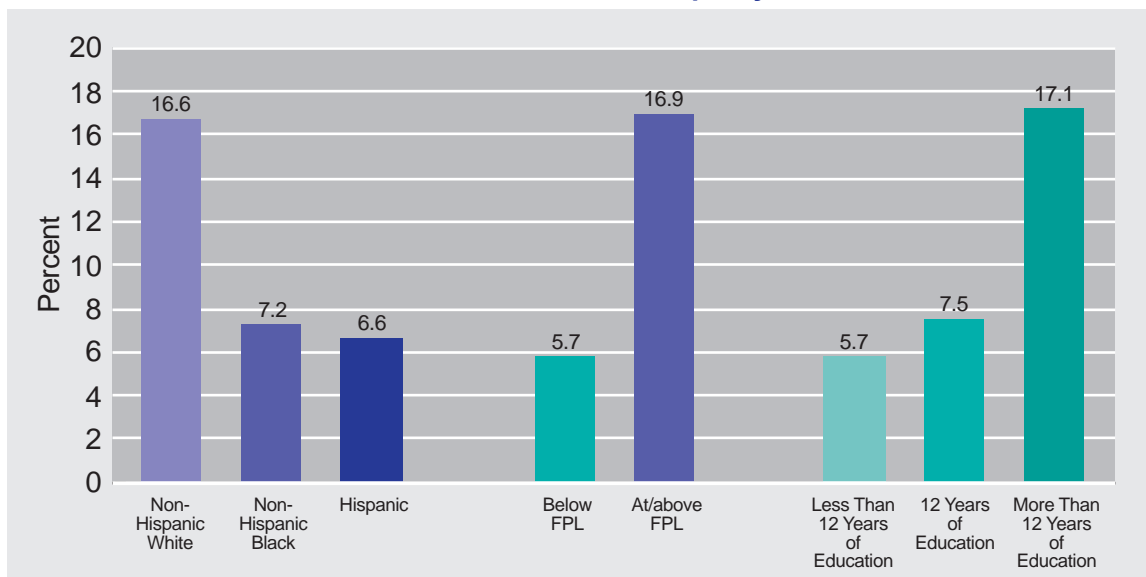
- The percentages of those reporting an oral cancer exam in the past year increased markedly between the NHIS interviews of 1992 and 1998 for all three racial/ethnic groups examined.

Bullets reference data that can be found in Table 13.2.1.

REFERENCES

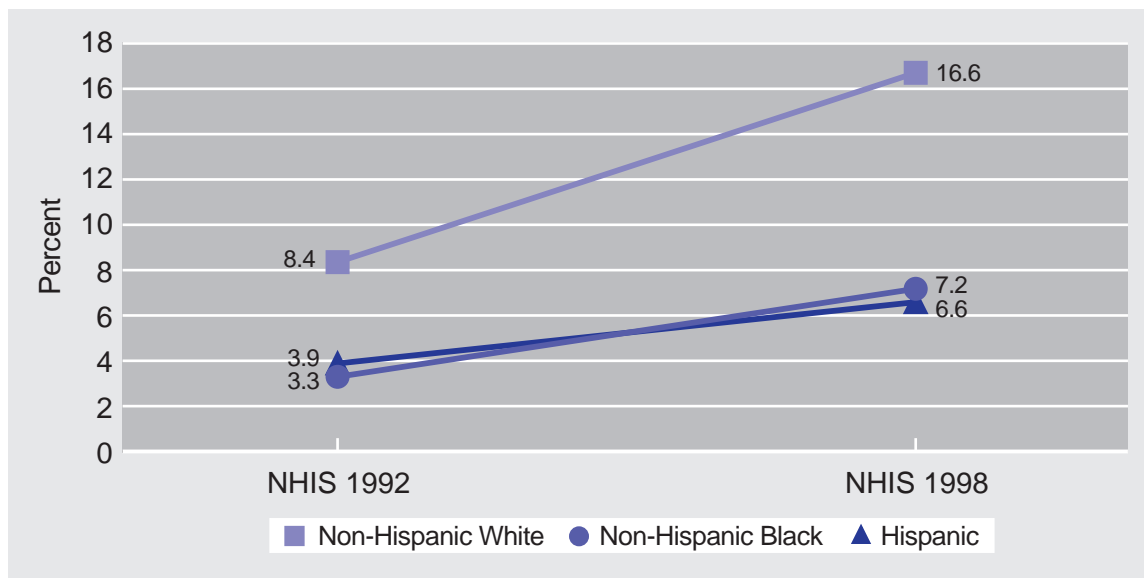
- Centers for Disease Control and Prevention. Current trends in examinations for oral cancer—United States, 1992. *MMWR* 1994;43(11):198-200.
- Goldman HS, Yellowitz JA, Horowitz AM. Oral cancer prevention. The role of family practitioners. *Arch Fam Med* 1995;4(7):628-36.
- Hawkins RJ, Wang EE, Leake JL. Preventive health care, 1999 update: prevention of oral cancer mortality. The Canadian Task Force on Preventive Health Care. *J Can Dent Assoc* 1999;65(11):617.
- Horowitz AM, Nourjah P, Gift HC. U.S. adult knowledge of risk factors and signs of oral cancer. *J Am Dent Assoc* 1990;126:39-45.
- Horowitz AM, Nourjah PA. Factors associated with having oral cancer examinations among U.S. adults 40 years of age or older. *J Public Health Dent* 1996;56:331-5.
- Horowitz AM, Moon HS, Goodman HS, Yellowitz JA. Maryland adults' knowledge of oral cancer and having oral cancer examinations. *J Public Health Dent* 1998;58:281-7.
- Horowitz AM, Drury T, Goodman HS, Yellowitz JA. Oral pharyngeal cancer prevention and early detection. *J Am Dent Assoc* 2000;131:453-62.
- Martin LM, Bouquot JE, Wingo PA, Heath CW Jr. Cancer prevention in the dental practice: oral cancer screening and tobacco cessation advice. *J Public Health Dent* 1996;56:336-40.
- Mashberg A, Samit A. Early diagnosis of asymptomatic oral and oropharyngeal squamous cancers. *CA-Cancer J Clin* 1995;45:328-51.
- Smith RA, Cokkinides V, von E, et al. American Cancer Society guidelines for the early detection of cancer. *CA Cancer J Clin* 2002;52(1):8-22.

Figure 13.2.1. Percentage of adults aged 40 and older who reported having had an oral cancer examination in the past year



Data source: 1998 National Health Interview Survey, National Center for Health Statistics, Centers for Disease Control and Prevention.

Figure 13.2.2. Trends in percentage of adults aged 40 and older who reported having had an oral cancer examination in the past year by race/ethnicity



Data source: 1992 and 1998 National Health Interview Surveys, National Center for Health Statistics, Centers for Disease Control and Prevention.

13.3 Oral and pharyngeal cancer deaths

Trends in 5-year survival rates for oral and pharyngeal cancer show essentially no changes for whites, blacks, or overall between 1974 and 1994 (Silverman, 2001, Harras et al., 1996; Swango, 1996). The 5-year survival rates between 1989 and 1994 for localized, regional, and distant stages were 82%, 43%, and 21%, respectively, for whites and 69%, 28%, and 13%, respectively, for blacks (Silverman, 2001; Arbes et al., 1999).

Oral and pharyngeal cancers show a differential in 5-year survival between whites and blacks of 22%, with rates of 55% and 33%, respectively, based on SEER data from 1986 to 1993. A multivariate model using SEER data linked to socioeconomic data suggests that lower socioeconomic status, more advanced stage at diagnosis, and differences in treatment accounted for 86% of the excess hazard (Arbes et al., 1999).

The oral and pharyngeal cancer mortality rate from 1988 to 1992 was 2.9 per 100,000. Mortality in males was more than twice that found in females (4.6 compared to 1.7 per 100,000). Mortality in blacks was about twice that of whites (5.2 compared to 2.7 per 100,000), with black males having four times the mortality rate of black females (9.2 compared to 2.2 per 100,000). For all demographic groups mortality is higher among older age groups (Swango, 1996).

SOURCE OF DATA

The analyses reported here are based on data from the 1998 National Vital Statistics System, National Center for Health Statistics, Centers for Disease Control and Prevention. All data have been age standardized to the year 2000 U.S. population (Anderson & Rosenberg, 1998).

■ Differences by race/ethnicity (Figure 13.3.1)

- Non-Hispanic blacks had the highest oral and pharyngeal cancer mortality rate, followed by non-Hispanic whites and Hispanics.

■ Differences by gender (Figure 13.3.1)

- The male oral and pharyngeal cancer mortality rate was more than double that of females.

■ Differences by education (Figure 13.3.1)

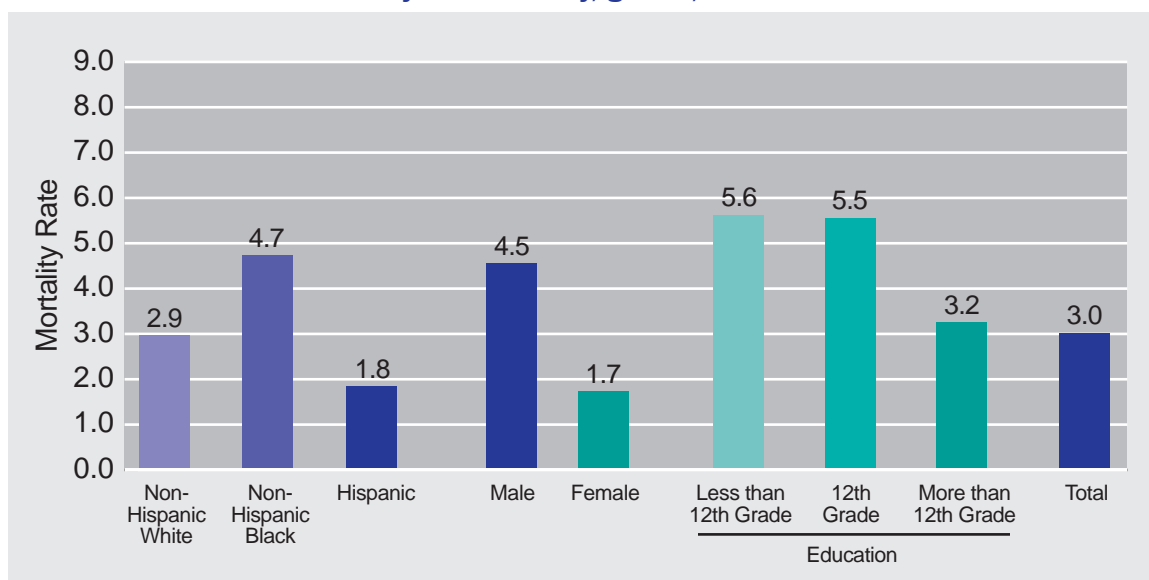
- Those with greater than a 12th grade education had a lower oropharyngeal cancer mortality rate compared to those with a 12th grade education or less.

Bullets reference data that can be found in Table 13.3.1.

REFERENCES

- Anderson RC, Rosenberg MH. Age standardization of death rates: implementation of the year 2000 standard, National Vital Statistics Reports, vol. 47, No. 3. Hyattsville, MD: National Center for Health Statistics, Centers for Disease Control and Prevention, National Vital Statistics System.
- Arbes SJ, Olshan AF, Caplan DJ, Schoenbach VJ, Slade GD, Symons MJ. Factors contributing to the poorer survival of black Americans diagnosed with oral cancer. *Cancer Causes and Control* 1999;10:513-23.
- Harras A, Edwards BK, Blot WJ, Ries LAG, eds. *Cancer Rates and Risks*. NIH pub. no. 96-691. Bethesda, MD: National Cancer Institute, 1996.
- Silverman S Jr. Demographics and occurrence of oral and pharyngeal cancers. The outcomes, the trends, the challenge. *J Am Dent Assoc* 2001 Nov;132 Suppl:7S-11S.
- Swango PA. Cancers of the oral cavity and pharynx in the United States: an epidemiologic review. *J Public Health Dentistry* 1996;56:309-318.

**Figure 13.3.1. Oral and pharyngeal cancer deaths (per 100,000*)
in 1998 by race/ethnicity, gender, and education**



*Age adjusted to the year 2000 U.S. standard population.

Data source: 1998 National Vital Statistics System, National Center for Health Statistics, Centers for Disease Control and Prevention.

13.4 Site-specific oral and pharyngeal cancer

More than one-quarter of oral cavity cancers reported in SEER data from 1973 to 1996 occur on the tongue. The incidence of tongue cancer, as compared to other types of oral cancer, has increased in the United States in the past two decades (Shiboski et al., 2000). The lip is the only site where oral cancer incidence has declined in SEER data during the 1985-1996 period.

From 1973 through 1996, white men and women showed an overall decrease in age-adjusted incidence rates of cancer of the lip and floor of the mouth. However, they experienced a significant increase in age-adjusted incidence rate of tongue cancer over the same period, especially among whites aged 35 to 39 years (Shiboski et al., 2000).

SOURCE OF DATA

The analyses reported here are based on Surveillance, Epidemiology, and End Results (SEER) Cancer Incidence Public-Use Database, 1937-1996, August 1998 Submission.

■ Distribution of oral cancers by anatomic site and stage at diagnosis

- The age-adjusted incidence rate for oral and pharyngeal cancer was highest for the tongue, followed by gum and other mouth, tonsil, salivary gland, and floor of the mouth. The oropharynx had the lowest rate among all sites (Figure 13.4.1).
- Cancers of the nasopharynx, tonsil, and hypopharynx were diagnosed more frequently at the advanced stage (Figure 13.4.2).
- Cancers of the tongue, salivary gland, floor of the mouth, and gum and other areas of the mouth were diagnosed with about equal frequency at localized and advanced stages (Figure 13.4.2).
- Cancer of the lip was more frequently diagnosed at the localized stage (Figure 13.4.2).

■ Differences by race (Figure 13.4.3)

- Blacks had higher incidence rates at most specific anatomic sites of oral and pharyngeal cancer. The exceptions were tongue, for which blacks have a higher rate, but the difference is not significant; salivary gland, for which whites had a higher rate, but differences were not significant; and lip, with whites experiencing a higher rate of lip cancer than blacks.

■ Differences by sex (Figure 13.4.4)

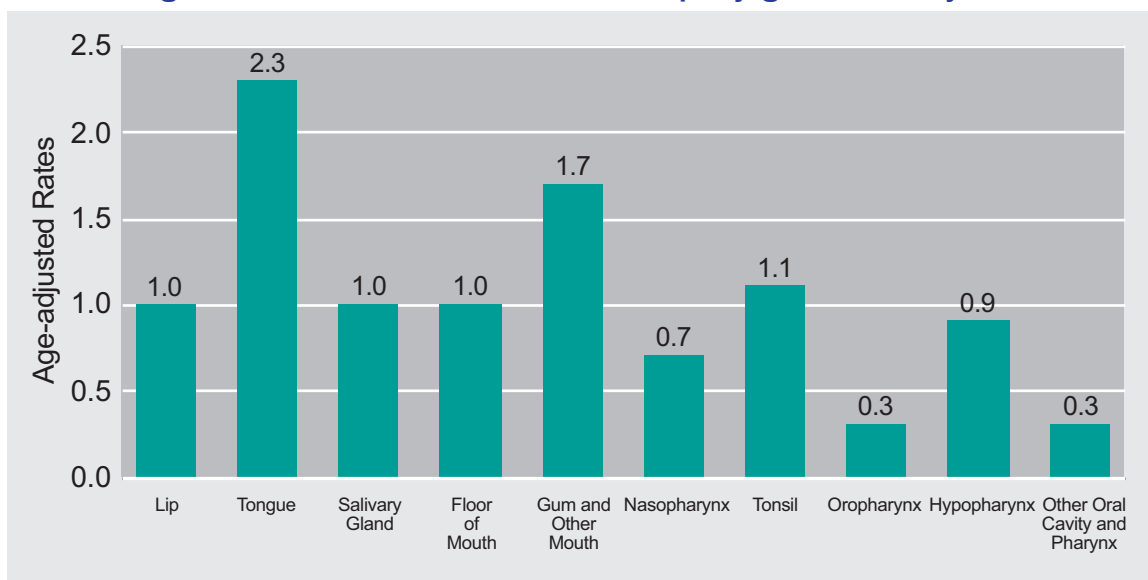
- For every site considered, males had a higher age-adjusted incidence rate of cancer than females.

Bullets reference data that can be found in Tables 13.4.1, 13.4.2, 13.4.3, and 13.4.4.

REFERENCE

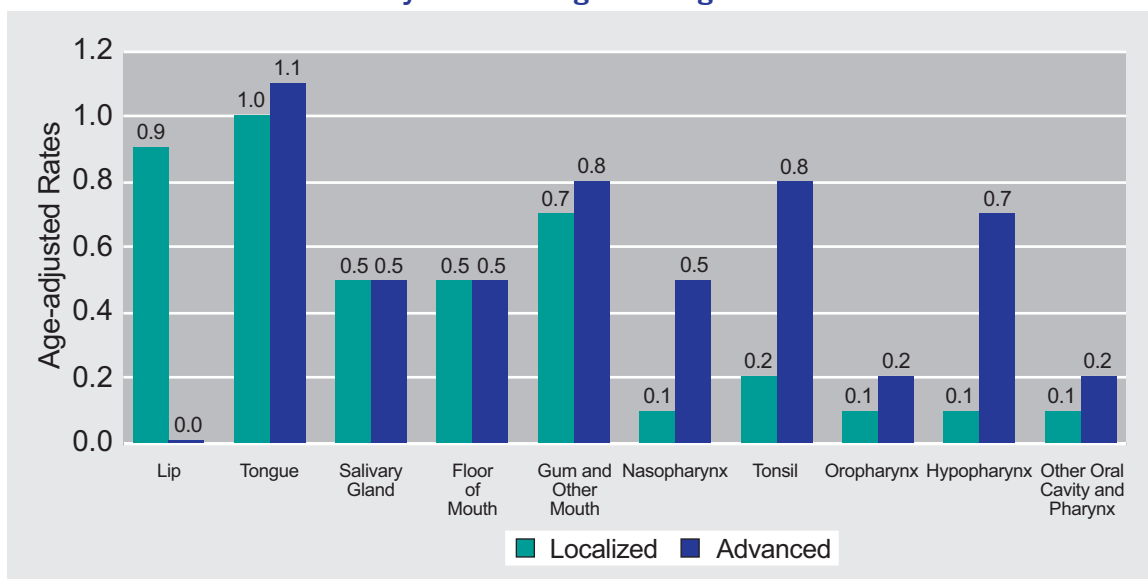
Shiboski CH, Shiboski SC, Silverman S Jr. Trends in oral cancer rates in the United States, 1973-1996. *Community Dent Oral Epidemiol* 2000;28:249-256.

Figure 13.4.1. Incidence rates for oral and pharyngeal cancers by sites



Data source: Surveillance, Epidemiology, and End Results (SEER) 11 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

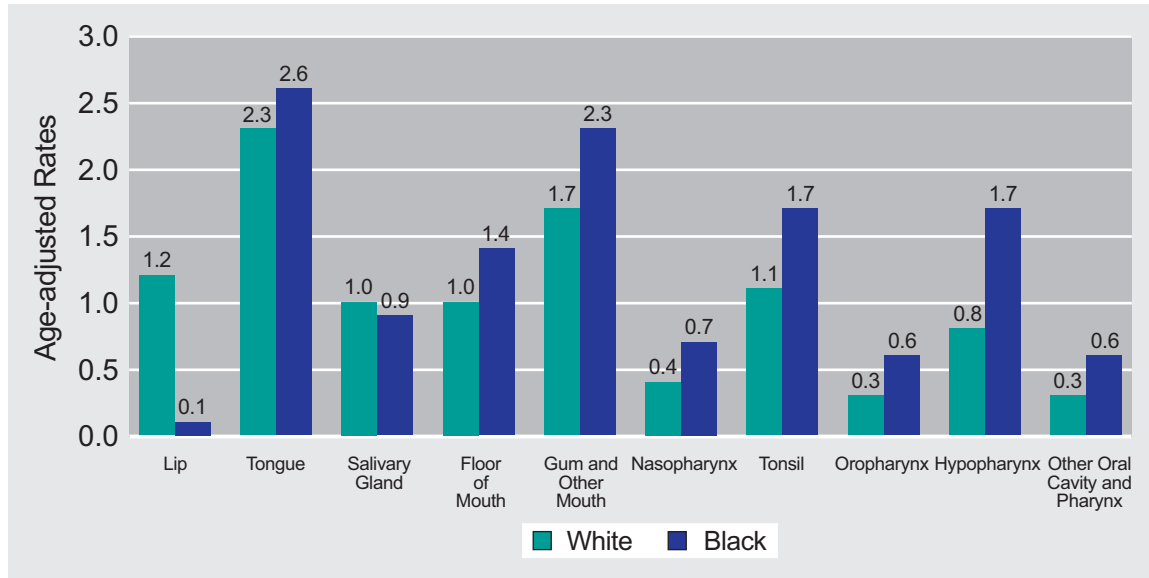
Figure 13.4.2. Incidence rates for oral and pharyngeal cancers by site and stage* at diagnosis



* The SEER stages of In Situ and Localized are combined into Localized; Regional and Distant stages are combined into Advanced.

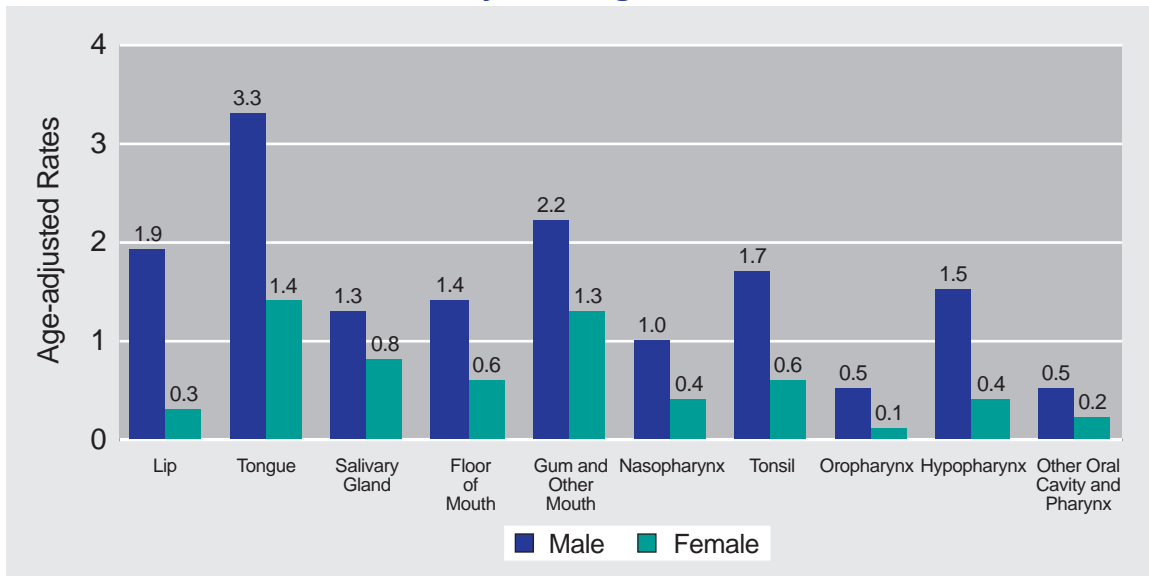
Data source: Surveillance, Epidemiology, and End Results (SEER) 11 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

Figure 13.4.3. Incidence rates for oral and pharyngeal cancers by site and race



Data source: Surveillance, Epidemiology, and End Results (SEER) 11 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

Figure 13.4.4. Incidence rates for oral and pharyngeal cancers by site and gender



Data source: Surveillance, Epidemiology, and End Results (SEER) 11 Registries Public-Use, August 1999 Submission (1992-1997). The rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

